

$$\sqrt{3x+13} - \sqrt{3(x+2)} = \sqrt{x+3} - \sqrt{x}$$

$$\sqrt{3x+13} + \sqrt{x} = \sqrt{x+3} + \sqrt{3x+6}$$

$$\cancel{3x} + 13 + \cancel{x} + 2\sqrt{3x^2+13x} = \cancel{x} + 3 + 3x$$

$$4 + 2\sqrt{3x^2+13x} = 2\sqrt{3x^2+15x+18} + 2 \quad 18$$

$$2 + \sqrt{3x^2+13x} = \sqrt{3x^2+15x+18}$$

$$4 + \cancel{3x^2} + 13x + 4\sqrt{3x^2+13x} = \cancel{3x^2} + 15x$$

$$4\sqrt{3x^2+13x} = 2x + 14$$

$$2\sqrt{3x^2+13x} = x + 7$$

$$4(3x^2+13x) = x^2 + 49 + 14x$$

$$12x^2 + 52x - x^2 - 49 - 14x = 0$$

$$11x^2 + 38x - 49 = 0 \quad \Delta = 361 + 539 = 900 = 30^2$$

$$x = \frac{-19 \pm 30}{11} = \cancel{-1} - \frac{49}{11} \text{ NA.}$$

TESTO $\Rightarrow \sqrt{3x+13} - \sqrt{3(x+2)} = \sqrt{x+3} - \sqrt{x}$

PROVA $x=1 \Rightarrow \sqrt{16} - \sqrt{9} = \sqrt{4} - \sqrt{1}$

$$4 - 3 = 2 - 1 \quad \text{OK!!!}$$

$x = 1$

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$$2\sqrt{x+5} - \sqrt{2x+1} = \sqrt{3x-3}$$

$$2\sqrt{x+5} = \sqrt{2x+1} + \sqrt{3x-3}$$

$$4(x+5) = 2x+1 + 3x-3 + 2\sqrt{6x^2-3x-3}$$

$$4x+20 - 5x+2 = 2\sqrt{6x^2-3x-3}$$

$$22-x = 2\sqrt{6x^2-3x-3}$$

$$484+x^2 - 44x = 24x^2 - 12x - 12$$

$$23x^2 + 32x - 496 = 0 \quad \Delta = 256 + 11408$$
$$4 = 108^2$$

$$x = \frac{-16 \pm 108}{23} = \begin{cases} -\frac{124}{23} \text{ N.A.} \\ \frac{92}{23} = 4 \end{cases}$$

PROVA
 $x=4$

$$2\sqrt{9} - \sqrt{9} = \sqrt{9} \text{ OK}$$

$$x = 4$$

DISEQUAZIONI IRRAZIONALI

n PARI $\sqrt[n]{f(x)} < g(x)$

$$\begin{cases} f(x) \geq 0 \\ g(x) > 0 \\ f(x) < g^n(x) \end{cases}$$

n DISPARI $\sqrt[n]{f(x)} < g(x) \Rightarrow f(x) < g^n(x)$

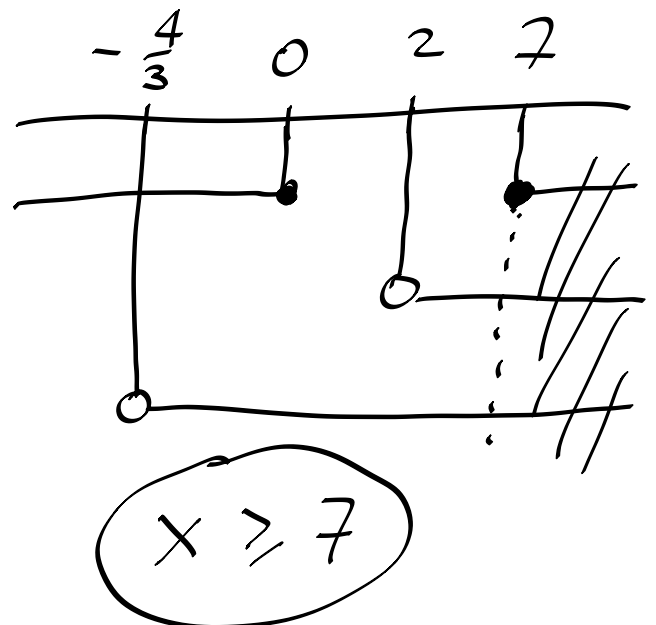
ESEMPIO

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$$\sqrt{x^2 - 7x} < x - 2$$

$$\begin{cases} x^2 - 7x \geq 0 \\ x - 2 > 0 \\ x^2 - 7x < (x - 2)^2 \end{cases}$$

$$\begin{cases} x \leq 0 \vee x \geq 7 \\ x > 2 \\ \cancel{x^2 - 7x} < \cancel{x^2} + 4 - 4x \\ -3x < 4 \Rightarrow x > -\frac{4}{3} \end{cases}$$



n PARI

$$\sqrt[n]{f(x)} > g(x)$$

$$\begin{cases} g(x) < 0 \\ f(x) \geq 0 \end{cases}$$

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$$\begin{cases} g(x) \geq 0 \\ f(x) > g^n(x) \end{cases}$$

n DISPARI

$$\sqrt[n]{f(x)} > g(x) \Rightarrow f(x) > g^n(x)$$

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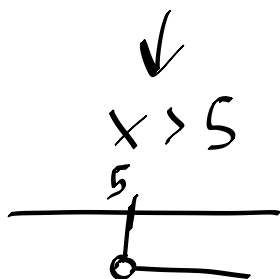
$$\sqrt{x^2 - 9} > 5 - x$$

$$\begin{cases} 5 - x < 0 \\ x^2 - 9 \geq 0 \end{cases}$$

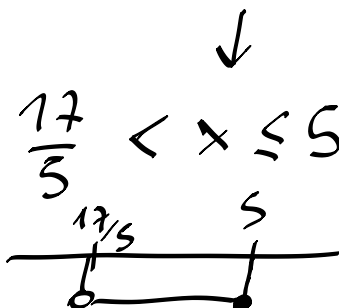
$$\vee \begin{cases} 5 - x \geq 0 \\ x^2 - 9 > 25 + x^2 - 10x \end{cases}$$

$$\begin{cases} x > 5 \\ x \leq -3 \vee x \geq 3 \end{cases}$$

$$\vee \begin{cases} x \leq 5 \\ x > \frac{17}{5} \end{cases}$$



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=>

$$x > \frac{17}{5}$$